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(54) Title: INFORMATION DISTRIBUTION SYSTEMS, PARTICULARLY TOUR GUIDE SYSTEMS

(57) Abstract

A system for the distribution of information, particularly at a tourist site, has a central computer network (1) with a main processor (DP) holding source data networked with node computers (NN). The computers of the network (1) are connected to a telephone exchange (2) which in turn connects to radio exchanges (3), sending to radio base stations (4) which relay and receive transmitted radio signals to/from portable telephone handsets (5). Data of the data source are indexed so that item-specific requests can be sent from the handsets, either manually or by automatic trigger, to initiate the sending of appropriate information items addressed to the appropriate handset (5) from the source data. One or more levels of data catching can be provided between the source data and the telephone exchange (2), to enhance simultaneous service of numerous handsets (5).

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INFORMATION DISTRIBUTION SYSTEMS, PARTICULARLY

TOUR GUIDE SYSTEMS

FIELD OF THE INVENTION

5   This invention relates to information distribution

systems, and particularly to guide systems for a particular

local site, e.g. for a tour guide.

BACKGROUND OF THE INVENTION

It is known to provide tour customers, e.g. at a museum

10   or other site of interest, with a portable audio apparatus

and a tape cassette. By means of a pair of lightweight

headphones, the customer can be directed from one feature to

another, and given information about the various features of

the tour. In many respects this has been found superior to

15   the traditional written programme, since the user's

attention is directed more efficiently to objects of

interest, and information about them can be given in a more

personal and vivid way. The system does however have

problems of inflexibility, since the tape cassette can only

20   be listened to in a "linear" fashion, so that the user must

follow a predetermined route along the tour, and listen to

the information that is given regardless of its interest to

that user.

Other known tour information systems involve

25   continually looped playbacks of information, at a given

site, to which the user must listen starting from the point

reached when the user arrives. This is time-wasting and

off-putting.

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SUMMARY OF THE INVENTION

A general aim herein is to provide novel information distribution systems, preferably suitable for use as a tour guide system.

5   The proposal now put forward involves a central body of pre-recorded information which is selectively accessible by a remote user at any one of a plurality of indexed items, using a portable remote unit which accompanies a user and includes means for receiving and then reproducing the

10   information as sound and/or text and/or picture. The system may include triggering units (generally a non-portable installation) which can communicate with the portable unit to trigger the sending and reproduction of certain items at the portable unit.

15   A preferred means of communication of information to the remote unit involves radio.

Broadly, the present disclosure relates to an information distribution system, preferably a tour guide system, having

20   a main data processor and store for a data source comprising audio and/or video data as a plurality of indexed pre-recorded items;

a plurality of remote user units, including portable wireless remote user units, each comprising means for

25   reproducing data from the data source in at least audio and/or video form;

communication means, preferably including a wireless link, for communicating between the remote user units and

the main data processor;

each remote user unit comprising item request means for
sending an item-specific request signal, and preferably one
selected from a repertoire of different such signals
available from that unit, via the communication means to the
main data processor, the main data processor having data
sending means for responding to the request signal by
retrieving the appropriate requested item of data from the
data source, and addressing and sending the item to the
remote user unit from which the request signal was received,
for reproduction thereat in at least audio and/or video
form. Note: the term "video" may include the option of text
format unless the context requires otherwise.

The main data processor may have the source data stored
on a static storage medium, such as hard disc, and
preferably has means for transferring or "caching" bodies of
data from the data source to a further, dynamic memory
store, such as RAM, for sending to the remote user unit. In
particular, the source data is preferably subdivided, or
subdividable, into data blocks each comprising one or
preferably a related plurality of data items, and the
processor has means for transferring or "caching" the
appropriate data block to dynamic memory, for sending to the
remote user unit, when a relevant request signal is
received. The data items which are relevant, in that they
have been specifically requested, can then be dedicated to
the user unit which requested them while freeing processing
of the main source to process requests from one or more

other users, typically for different data, and desirably
with further caching of that different data. It is
particularly preferred to have a plurality of node dynamic
memories with respective processing capabilities, each

5   serving a respective data communication connection or set of
such connections, and with means for transferring
temporarily to any of the node memories a block of data as
mentioned above, appropriate to the request signal(s)
received for that node. In this way there may be

10   established two and preferably more levels of data caching
between the static data source and the remote user units,
enabling prompt and high-speed simultaneous dissemination of
data, in an independent manner, to a substantial number of
remote user units, while requiring only a single original

15   set of "static" data.

A suitable main processor may conveniently be achieved
by using, in effect, a computer local area network as the
main data processor, that network having

a main network server computer with the static data

20   source, preferably having also a first level of data caching
capability e.g. provided by a sufficiency of RAM and
suitable disc caching software (which is currently
commercially available and known to the computer
practitioner of ordinary skill), and

25   a plurality of network node computers interfacing with
the communication means by way of suitable respective
interfaces, and preferably providing a second level of data
caching e.g. with respective RAMs and appropriate disc

5

caching software as mentioned above.

The communication means may comprise a communications exchange such as a telephone PBX, which may be of a generally known type, for routing signals and data

5   transmissions vis à vis the main data processor.

The communication means preferably further comprises a radio link between the main data processor and the remote user units. For example, a telephone exchange as mentioned above may connect to a radio exchange, or more usually

10   plural radio exchanges, to communicate with the remote user units which are adapted to receive and send radio signals. It may also be generally desirable to provide radio base stations, for the forwarding of radio signals travelling between the radio exchange(s) and the remote user units.

15   Communication means of the preferred type described above may conveniently be provided by a cellular telephone system, e.g. of a known type, in which the remote user units comprise telephone handsets. The radio exchanges and radio base stations may be comprised in a cellular local

20   communications system, preferably of the "intelligent" type i.e. capable of tracking the caller or recipient and making any appropriate transfers of the call from station to station automatically. Suitable systems and components therefor - the CT-3 type, for example - are commercially

25   available. The tracking ability whereby communication is traced and handed off from one station to another may be built into the stations and/or the remote user units themselves. This is known *per se*.

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The communication means are usually mutually dedicated, i.e. the remote user units and the central main processor can communicate with one another on the site, but not with other communication apparatus in the adjacent environment.

5   This is achieved e.g. by selecting a characteristic communication frequency.

BRIEF DESCRIPTION OF THE DRAWINGS

More specific proposals are now described, by way of example, with reference to the accompanying drawings in

10   which

Figure 1 is a schematic diagram of an information distribution system, and

Figures 2 and 3 are perspective views of alternative types of remote user unit.

15   DETAILED DESCRIPTION

A proposed preferred embodiment comprises the following basic components.

A computerised data source network 1;

a telephone exchange 2 connected to the data source

20   network;

a set of cellular communications radio exchanges 3 connected to the telephone exchange 2;

a set of cellular communications radio base stations 4 for relaying transmissions to and from the radio exchanges

25   3, and

a plurality of remote user units including wireless telephone extensions 5 for the cellular communication system and, optionally, wired extensions 6 (some or all of which

may be connected directly to the telephone exchange rather than to the radio base stations 4).

The data source network 1 may be in essence a computer local area network assembled within a single enclosure. It comprises a main network server computer (DP) which is a high-specification PC, e.g. 486DX class or faster. It should have a hard disc drive or other stable static storage medium to hold the basic mass of source data. A suitable capacity to provide acceptable audio quality might be a minimum of 10 Mb/hour of monaural non-music compressed speech, 30 Mb/hour of monaural non-compressed music and/or speech, or 60 Mb/hour of stereo non-compressed music and/or speech. Of course, the total capacity is determined to be sufficient for the amount of program information which must be stored in each case. Similar criteria can be determined for video data (which may be text) without difficulty.

The main network server computer (DP) also has substantial RAM e.g. at least 32 Mb. A video interface card to facilitate temporary attachment of a monitor is useful, as is one or more connections 10 to facilitate the attachment of diagnostic equipment or additional peripheral communications equipment (P).

The network also has multiple computers functioning as network nodes (NN) in conjunction with the main network server (DP). These do not need such a high specification as the network server. 386SX or faster computers should be suitable. Each should have a substantial RAM e.g. at least 16 Mb. A video interface for a monitor is also desirable.

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The network nodes (NN) are also provided with telephone network interface cards 17 in a quantity sufficient to provide individual connections for as many remote user units as may be envisaged.

5   In addition to routine operating system software for each computer and network operating system software for the network 1, the computers (DP,NN) of the network are also programmed with high-speed disc caching software enabling the selective transfer of blocks of data to the RAMs of the

10   main network server (DP) and of the nodes (NN). Disc caching and appropriate software are already known and available to the skilled person.

It is also necessary that the network be able to address and access the stored data by addressed item, using

15   incoming telephone signals as selective identifiers. For this purpose the programme application software may use "voice mail" (telephone message) programming of a type which is in itself known. Indeed, commercial voice mail software may be adapted for the present purpose.

20   The telephone exchange 2 may be a standard DTMF (tone capable) telephone PBX, preferably capable of connection by digital interface to enable high-speed high-volume handling. It is connected with the network computers by multiple-line wired connections 11.

25   The radio exchanges 3 connected to the telephone exchange 2, the function of which is to send data to and receive signals from the remote user units 5, may be "cellular" wireless local communications system radio

exchanges (RE) of a known type, preferably an "intelligent"
type capable of tracking the caller/recipient automatically,
such as the CT-3 type. The number of units required will
vary according to the site served by the guide system, and
according to the number of remote user units 5,6 to be
served.

The radio base stations 4 are "intelligent" wireless
cellular local communications system components (RB),
capable of intelligent hand-off call transfer from one call
to another, e.g. of CT-3 type. As with the radio exchanges,
the number of these units will vary according to the size
and physical nature of the site to be covered and the number
of remote user units, particularly wireless extensions 5,
which are to be used.

The number of wireless remote user units 5 such as
telephone handsets (H) will vary according to the nature of
the site and how many persons might be expected to tour it
at any one time. Wired extensions (W) may also be used,
e.g. for certain static features at the site, or if a video
display of substantial size is needed.

The preferred system also includes at least one
automatic data request initiator 15 which we term a
"location relay switch" (LRS) that is, means provided
fixedly at a particular site or location to cause an
adjacent remote user unit 5' automatically to request some
specified data without user initiation. The number of such
units will of course vary according to the site, depending
on the number of different locations for which such

automatic guidance of the system will be appropriate.

A typical site covered by the entire system might be 6km² or less.

An example of assembly and operation of the system is now described.

Assembly Example

The data source network computer is a local area network assembled within one enclosure. It comprises a 486DX or faster computer platform serving as the network server, and multiple 386SX or faster computers serving as network nodes.

The network server should be assembled with a minimum of 32 Mb of RAM.

The network nodes should each be assembled with a minimum of 16 Mb of RAM.

Each of the computers within the local area network (server and all nodes) should be assembled and operating with standard operating systems compatible with the requirements of the selected programme application software and network operating system software used to operate the voice mail systems and the network.

Network connection cards 16 should be installed in each of the computers, one for each node, and one for the main server. The diagram shows respective connections from the server, but serial or "daisy chain" configuration of the local area network is also possible.

Telephone interface cards 17 are installed in each of the network node computers. The number of interface cards

will be dependent on the number of wired and/or wireless

extensions (W,H) required by the individual site.

After the standard operating system has been installed

on all computers, the network operating software is

5   installed and tested for stable operation.

After the network operating software has been

installed, high-speed disc caching software is installed on

each computer and set up to utilise optimally the RAM

available, depending on the size of the system and number of

10   end users envisaged. The disc caching software on the

network server serves as a primary disc cache to the entire

network for all accesses made to the stable static storage

media, regardless of whether the system is utilising one or

more voice mail systems or one or more stable static storage

15   media. The disc caching software on the network nodes acts

as a secondary disc cache for stored audio program

information requested by the telephone interface cards

within each of the network nodes. This multiple level of

high-speed information caching allows the centralisation of

20   the stored information without impeding the high speed

dissemination of different, uniquely selected data items to

various selected ones of large numbers of extensions

simultaneously.

At this point the program application software is

25   loaded, namely voice mail software capable of controlling

and monitoring all requests, and distribution of the program

information through the system to the final extensions.

After the program application software is loaded the

audio program information, i.e. the main source data, is installed, with assigned voice mailbox addresses for the items, via the program application software. The audio program information is information that has been recorded

5   either in analogue form and translated to digital form, or recorded directly in digital form. This audio program information is the information that is stored on the stable static storage medium of the main network server in the voice mailbox addresses. The present guide information

10   system can deliver information in a sequential manner, similar in experience to previous mechanical systems, but unlike any previously devised system the audio program information can also be accessed at random, or "nested" such that a user may access detailed information following

15   delivery of initial general information, and then return to the point in the sequential information flow from which they digressed. This can be done by keying-in item-specific requests on the user unit keypad. For example, the audio information describing some feature in general terms will

20   tell the user the number to key in order to access more detailed information.

A visitor will be able, say, in the British Museum to wander at will - having a properly constructed "tour" of the Egyptian gallery or of a special exhibition, and yet also

25   stop by a particular Greek vase and using its catalogue number he or she can then enjoy a 3 or 4 minute piece just on that item. This might encourage the visitor to request a special structured tour of the Vase Room - or he or she

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might walk on, selecting other exhibits at random. Every

piece of information is indexed to start at its beginning.

As potential user access will need to be determined,

and a smooth, logical sequential flow of the audio program

5   information will be needed, planning appropriate to the site

should be exercised at the time of selecting, planning,

itemising and grouping the items of the source audio data.

This organisation need not in itself require any inventive

effort; it may be done using known principles of information

10   structuring and indexing.

The telephone private branch exchange (PBX) is

connected to the data source network via standard telephone

connections running from the telephone interface cards

mounted in the network nodes. Each of the telephone

15   interface cards represents a number (for example, eight to

sixteen) telephone extensions to be controlled by the PBX 2.

The PBX will connect outbound in two ways. First the PBX

will be connected to the intelligent radio exchanges 3 e.g.

via standard telephone connections. Second, the PBX will

20   have one outbound hardwire telephone company connection 12.

The radio exchanges are installed throughout the site,

and may be remote e.g. as much as two miles from the

location of the PBX/data network source computers. The

radio exchanges should be placed throughout the site in a

25   manner consistent with their ability to contact as many of

the radio base stations as possible, dependent upon

individual factors of the environment of the site

(construction materials used, distance covered, and the

number of wireless extensions to be serviced at any given location throughout the site). Planning appropriate to the site should be exercised at the time of installation when the radio base station locations are determined.

5   The radio base stations are the final link to the wireless extensions i.e. the remote end user units. The locations of the radio base stations are dependent upon the environment of the site. The construction materials (if any) of the site, and the number of wireless extensions

10   potentially simultaneously present within a specific location on the site will determine the placement and saturation of the radio base stations. Traffic flow envisaged through the site at various times could require installation of more radio base stations throughout the

15   entire site than could in fact feasibly operate at any one time. A high density of radio base stations will be necessary to handle areas of extreme density of traffic, while conversely some larger areas, with a low density of features of interest, may require only a few radio base

20   stations.

The wireless extensions may take the form of telephone handsets, or wireless headsets with or without wired or attached control boxes (similar in appearance to personal headset stereos). See Fig. 2, which shows an audio-only

25   handset with built-in speaker 52. Both types, along with standard wired telephone extensions, may be mixed on the same system. A wireless extension consists e.g. of a CT-3 or similarly-capable telephone extension, with a keypad 51

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and small radio frequency receiver built into one box. The

radio frequency receivers receive brief coded pulse

transmissions from any adjacent location relay switches to

request automatically (via DTMF tones) through the extension

5   the delivery from the data source network of specific data

items (identified by mail box addresses), pertinent to the

location of the wireless extension, i.e. the location of the

user. Each wireless extension will have its own unique

telephone extension number in the case of monaural

10   installations, or possibly two numbers in the case of stereo

installations depending on the form of data encoding or

stereo derivation used. These wireless extensions,

regardless of other features, generally have keypads 51 that

are either numeric in nature, similar to a standard

15   telephone keypad, or the keys may be masked in the form of

international symbols, or merely shown as coloured buttons

in order to facilitate ease of use and user understanding.

These keypad masks may be determined by the requirements of

the individual sites.

20   A handset may have a text and/or video display, e.g. a

scrollable text output for use by the deaf instead of an

audio set. See Fig. 3 which shows a handset with keypad 51

and video display 53, e.g. LCD text display, together with

wired headphones 54.

25   The location relay switches for triggering automatic

request signals may consist of small, extremely low power,

radio frequency transmitters that emit a momentary

predetermined pulse signal. The pulse signal corresponds to

a predetermined DTMF tone series recorded on a ROM chip

within the radio frequency receiver built into each user

unit. The DTMF tone signal is transmitted from the wireless

extension of the voice mail system on the data network

5   server to request the delivery of a specific voice mail box

item, selected of course to be pertinent to the location of

the location relay switch. The location relay switches may

be triggered by any number of standard person-sensitive

triggering devices, such as broken light beam, pressure-

10   sensitive switch floor pad or infrared motion detector.

They need not necessarily be hardwired into the system; they

may simply be plugged into the mains.

In an alternative use of location relay switches, the

location relay switches passively receive characteristic

15   identifier signals communicated by the remote user units.

Such "active location identifiers" are available; typically

they operate by an infrared signal characteristic unique to

a given remote user unit, and which is noted by the location

relay switch. Instead of the user unit sending a request

20   signal, it then becomes possible for the location relay

switch (knowing as it does the location and the identity of

the remote user unit) itself to send an item-specific

request signal through the communication means (which might

be hardwired, or involve a wireless link) to initiate, in

25   the manner previously described, the sending of appropriate

data to that remote user unit. This may constitute an

independent aspect of the present disclosure, in which the

initiation of all data sending to the remote user units is

done from the location relay switches rather than by item-
specific requests sent from the remote user units.

Typically, however, this technique is mixed with a
potential item-specific signalling capability of the remote
5   user units, as described elsewhere. In effect, it
constitutes an automated location tracking of each specific
remote user unit.

Operation

When the data source network; the private branch
10   exchange, the radio exchanges and the radio base stations
are powered up, the data source network automatically loads
the computer operating system, the primary and secondary
disc caching software, the network operating system, and
initialises the voice mail system. Once the entire system
15   is successfully powered up, the data source network and
private branch exchange are left powered on at all times,
twenty-four hours per day. The radio exchanges and radio
base stations may be powered down when not in use in order
to conserve energy. The wireless extensions should be
20   placed in battery charger bays in order to be ready for use
when next needed.

To use the system a user (or a guide) picks up a
wireless extension headset, and enters a unique number on
the keypad indicating the language in which they would like
25   to hear their information delivered. The source data is
available in two or more languages. For ease of use, these
language codes may be programmed to correspond to
international dialling codes, or any other easily recognised

series. This initial keypad entry will tell the data source network which of the concurrent voice mail systems to access. The user or guide will then enter on the keypad any other determinant information, for example in the case of a

5   museum tour, which type of tour the user wishes to receive (historical, art, cuisine, etc.). This entry will tell the data source network which voice mail box to use as the first address. An entire block or body of standard information e.g. sufficient for all or a significant part of the tour,

10   may be shifted onto RAM by the disc caching at this stage. From that RAM, the user can hear audio program information delivered seamlessly and sequentially as the voice mail system moves through delivery of the programmed addresses. If the user leaves a standard tour path corresponding to the

15   recorded sequential delivery of the audio program information, planning and forethought in placement of appropriate location relay switches will result in a location relay switch triggering the wireless extension to automatically request delivery of the contents of a mailbox

20   address such that the user receives information pertaining to the correct location in which the user actually stands, sits or rides. Additionally or alternatively, the user may be prompted via narration in the audio program information to request specific voice mail box addresses via the keypad

25   on the wireless extension in order to receive additional information on any point in the site, or to adjust the order in which information is delivered.

The centralised storage of data in the data source

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network, and the use of primary and secondary disc caching

software, allows decompression and real-time delivery of

large amounts of unique and simultaneous information to the

remote user units.

5   Further options include the following.

For security, if a user unit is removed beyond some

exit point, a corresponding location relay switch causes the

phone code of a security guard to be sent, announcing the

handset location and number, and/or emitting a distinctive

10   tone from the user unit.

For automatic billing, the system may comprise means to

produce a full account of the number and duration of all

uses of each handset, and to transmit this information

automatically to a system operator e.g. by telephone modem,

15   for the production of e.g. monthly bills.

Users may opt, via the keypad to obtain a print-out of

information on items of particular interest to them.

Information in the system may be added-to or updated by

simple re-programming of the central computer, either

20   locally at the site or via remote access from an operator's

office.   Note the enormous economy and simplicity of

centralised data update, compared with the use of individual

user's tape cassettes, discs or data cards which need to be

replaced en masse.

25   The system may provide for two-way mobile

communications between members of staff. This involves

additional small pocket handsets, each with a specific staff

code number.

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While the system has been described in relation to a
tour guide system, its use of a mass of centralised
dedicated data combined with on-site dedicated communication
renders it suitable for a variety of uses. Other proposed

5   areas of application include information distribution at a
shop or warehouse, where a potential buyer moving around the
premises can obtain information about items which are seen,
and can also signal from his/her remote user unit an
intention to purchase, enabling items from stock to be

10   retrieved in advance to be ready for collection by the
buyer.

Further application is an educational application, e.g.
in which permanemt source data relating to a site may be
supplemented by data dedicated to certain identified user

15   units such as sets of questions relating to the site,
whereby those identified users will receive the questions
together with the information and be able to input answers
contemporaneously into their units for sending to the
processor e.g. for comparison with predetermined answers.

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CLAIMS:

1.   An information distribution system for a site, having
       data processor and storage means (1) for a centralised
5   data source comprising audio and/or video data as a
      plurality of indexed items;
         a plurality of portable, wireless remote user units
      (5), comprising means for receiving and reproducing data
      from the data source in at least audio and/or video form;
10   communication means (11,2,3,4) for mutually dedicated
      communication within the site between the remote user units
      (5) and the data processor and storage means (1);
         said portable, wireless remote user units (5)
      comprising item request means for sending an item-specific
15   request signal via the communication means (4,3,2,11) to the
      data processor and storage means (1);
         the data processor and storage means (1) having
         data caching means for responding to an incoming said
      request signal by identifying the appropriate indexed item
20   of data and transferring a data block, comprising said
      appropriate item and optionally one or more related items
      for subsequent transmission, temporarily to a dynamic
      memory, and
         data sending means for sending the data block
25   progressively from the dynamic memory, selectively to the
      remote user unit (5) from which the request signal was
      received, for reproduction thereat in at least audio and/or
      video form.

2.   An information distribution system according to claim 1 in which the remote user units (5) comprise handsets and/or headsets.

5   3.   An information distribution system according to claim 1 or claim 2 in which the remote user units (5) comprise video display means (53).

4.   An information distribution system according to any one

10   of the preceding claims in which the data processor and storage means (1) comprises a processor network having

a main network server processor (DP) for said data source, and

network node processors (NN) respectively interfacing

15   with the communication means (11,2,3,4).

5.   An information distribution system according to claim 4 in which each of the network server processor (DP) and plural said network node processors (NN) comprise said data

20   caching means, to provide plural levels of data caching between the data source and the communication means (11,2,3,4).

6.   An information distribution system according to any one

25   of the preceding claims, comprising at least one fixed automatic data request initiator (15) for wireless signalling to an adjacent said remote user unit (5), to cause that remote user unit (5) to send automatically a said

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item-specific request signal, corresponding to at least one

indexed item of data appropriate to that data request

initiator (15).

5   7.   An information distribution system according to any one

of the preceding claims comprising at least one fixed

automatic data request initiator (15), interactive with an

adjacent said remote user unit to note the identity of that

remote user unit (5), and comprising means to send to the

10   data processor and storage means (1) an item-specific

request signal corresponding to at least one indexed item of

data appropriate to that data request initiator (15) and a

unit identifier signal identifying said remote user unit

(5), whereby the data processor and storage means (1) sends

15   said indexed item of data selectively to that remote user

unit (5).

8.   An information distribution system according to any one

of the preceding claims in which the communication means

20   comprises

         radio exchange means (3) and radio base means (4) to

communicate with one another by radio, the radio exchange

means (3) being in wired communication with the data

processor and storage means (1) and the radio base means (4)

25   being in wireless communication with the remote user units

(5).

9.   An information distribution system according to any one

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of the preceding claims in which the communication means comprises telephone exchange means (2) and telephone connection means (11) between the data processor and storage means (1) and the telephone exchange means (2).

5

10.   An information distribution system according to any one of the preceding claims, further comprising at least one non-portable, wired remote user unit (6).
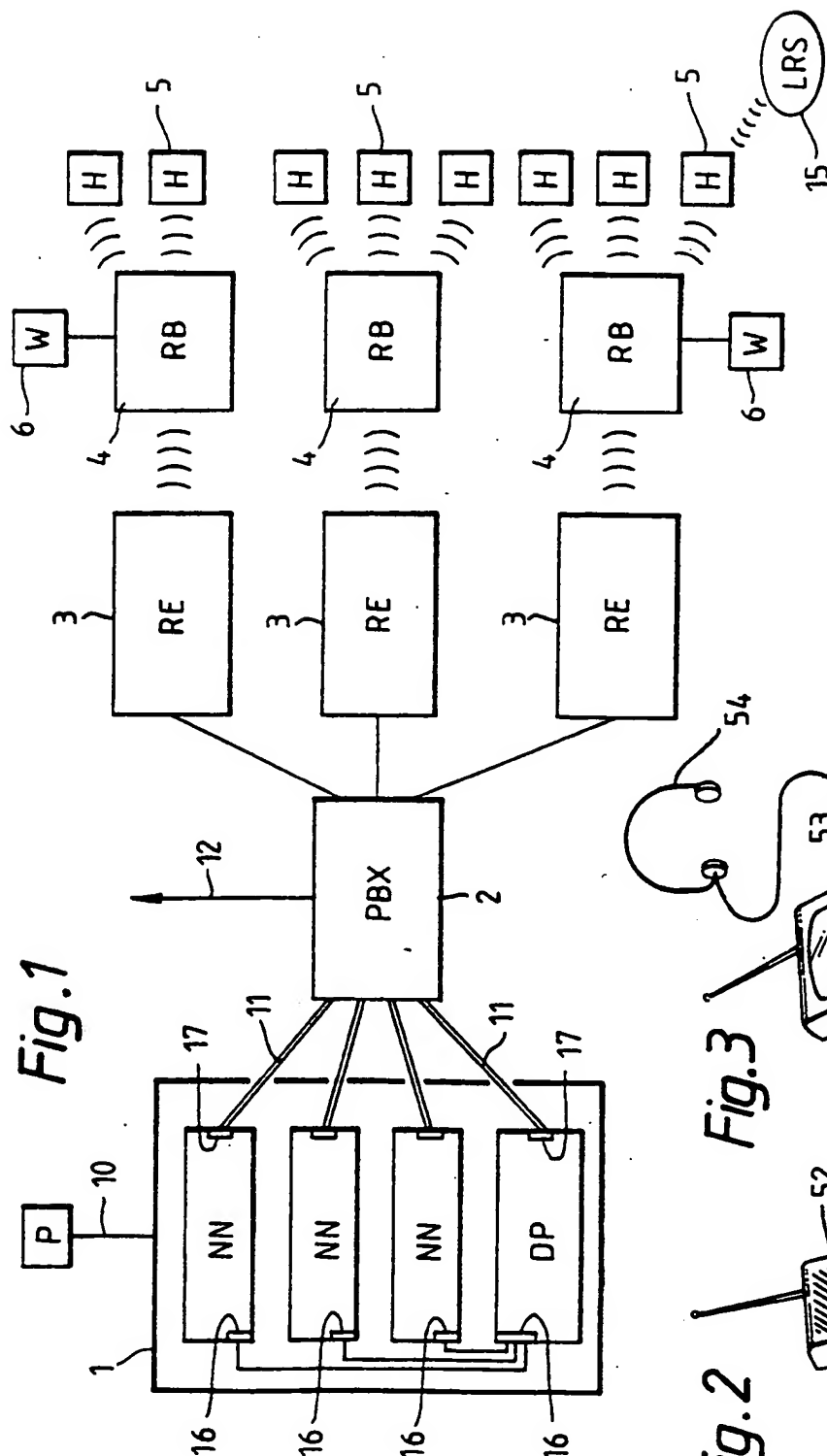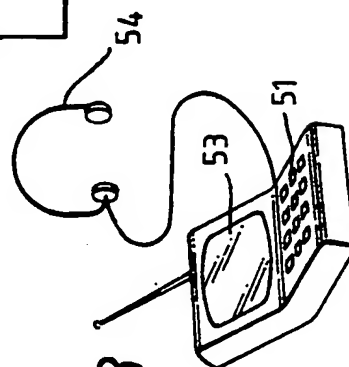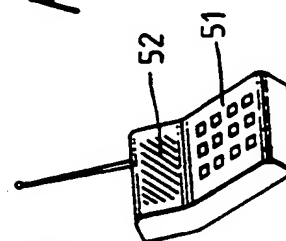
10

Fig.1

Fig.2

Fig.3

A. CLASSIFICATION OF SUBJECT MATTER

H 04 J 3/16,G 06 F 15/21

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H 04 J,H 04 B,G 06 F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4 163 123 (BRODSKY et al.) 31 July 1979 (31.07.79), the whole document; especially claim 1; fig. 1-8.	1-3,5, 8-10
Y	US, A , 5 157 660 (KUWAHARA et al.) 20 October 1992 (20.10.92), the whole document; expecially claims 1-3; fig. 1-16.	1-3,5, 8-10
A	US, A, 5 152 003 (POCH) 29 September 1992 (29.09.92), claims 1-11; fig. 1-2.	1
A	US, A, 4 750 151	1

☐ Further documents are listed in the continuation of box C.

☐ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 February 1994	10.03.94

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016	MIHATSEK e.h.

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	(BAUS) 07 June 1988 (07.06.88), claim 1; fig. 1-5. ————	

zum internationalen Recherchenbericht über die internationale Patentanmeldung Nr.

to the International Search Report to the International Patent Application No.

au rapport de recherche international relatif à la demande de brevet international n'

PCT/GB 93/02360 SAE 82229

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentdokumente angegeben. Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

This Annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The Office is in no way liable for these particulars which are given merely for the purpose of information.

La présente annexe indique les membres de la famille de brevets relatifs aux documents de brevets cités dans le rapport de recherche international visée ci-dessus. Les reseignements fournis sont donnés à titre indicatif et n'engagent pas la responsabilité de l'Office.

Im Recherchenbericht angeführtes Patentdokument / Patent document cited in search report / Document de brevet cité dans le rapport de recherche	Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
US A 4163123	31-07-79	keine - none - rien	
US A 5157660	20-10-92	JP A2 3109848	09-05-91
US A 5152003	29-09-92	AU A1 64422/90	16-05-91
		CA AA 2070392	19-04-91
		EP A1 496743	05-08-92
		WO A1 9106158	02-05-91
US A 4750151	07-06-88	AU A1 47812/85	10-04-86
		AU B2 576893	08-09-88
		CA A1 1242807	04-10-88
		DE A1 3436390	10-04-86
		DE C2 3436390	05-11-87
		DK A0 4514/85	03-10-85
		DK A 4514/85	05-04-86
		EP A2 176959	09-04-86
		EP A3 176959	20-07-88
		ES A1 547619	16-12-86
		ES A5 547619	16-01-87
		ES A1 8702673	16-03-87
		ZA A 8507538	25-06-86